June 28, 2012

Ms. Marlene Dortch
Secretary
Federal Communications Commission
445 12th Street SW
Washington, D.C. 20554

Re: RM No. 11663
WT Docket No. 11-69
ET Docket No. 09-234

Dear Ms. Dortch:

This is in response to the Petition for Rulemaking filed by Harris Corporation on April 30 in this proceeding. In its Petition, Harris asks the Commission to change the Rules so as to preclude the use of Mask B technologies in public safety spectrum. Harris also urges that the Commission mandate modulation standards for interoperability channels. It further seeks an "immediate freeze" on the use of Mask B equipment in all public safety bands, and on the certification of equipment lacking compatible modulation for mutual aid channels, pending the outcome of the requested rulemaking.

There is no merit to the Harris Petition. It represents a continuing effort to manipulate the regulatory process so as to further its commercial interests. Commission Rule 1.401 states that "Petitions which are moot, premature, repetitive, frivolous, or which plainly do not warrant consideration by the Commission may be denied or dismissed without prejudice to the petitioner." For the reasons set forth below, the Harris Petition for Rulemaking should be dismissed or denied as repetitive, unsupported, and "plainly ... not warrant[ing] consideration ...." Rule 1.401.

Introduction

As the Commission is aware, PowerTrunk is a manufacturer of advanced digital land mobile radio products (D-LMR). PowerTrunk offers a technology that has been widely recognized as more spectrally efficient and cheaper than existing public safety equipment currently in use in the United States.[1] Specifically, PowerTrunk's equipment is offering customers the benefits of digital technology, and greater throughput and spectral efficiency, at significantly reduced price points compared to legacy vendors and older technologies.

[1] "The Benefits of Transitioning to a Nationwide Wireless Broadband Network for Public Safety", White House Report, pp. 9-10, June 2011 (Ex. A)

PowerTrunk has invested significant resources in developing a spectrum-efficient technology in compliance with the U.S. laws and rules. PowerTrunk's equipment has been scrutinized by Commission-approved labs and by the Commission itself, and PowerTrunk's type-acceptance certificates are in full force and effect. This investment is already producing public interest benefits in terms of cost-effective alternative solutions for land mobile users.

Discussion

Preliminarily, Harris first[2] raised its objections to PowerTrunk's equipment only after it (Harris) had lost its bid for the New Jersey Transit communications equipment contract.[3] Harris' first objection (that dated March 16, 2012) was filed two days after the Board of Directors of the New Jersey Transit Corporation ("NJT") approved by unanimous vote the Alcatel-Lucent proposal which included reliance on PowerTrunk equipment. This, despite the fact that Harris had been an active participant in Commission Docket No. 11-69 for over two years, and undoubtedly had been aware of PowerTrunk's June 8, 2011 letter expressly setting forth PowerTrunk's views regarding compliance of its D-LMR equipment with Commission Rules.

Harris has continued its effort against PowerTrunk at the Commission in order plainly to further its competitive position in New Jersey. While the Commission is familiar with efforts by interested parties to manipulate the regulatory process so as to gain competitive advantage in the marketplace, Harris' continued efforts, manifested most recently by its Petition, is a particularly egregious example of the type.

Second, the Harris Petition seeks to rehash issues already once resolved, i.e., it is repetitive. As the record in Docket 11-69 shows, PowerTrunk's D-LMR equipment was awarded type-acceptance for Part 90 in July 2010. Then, just a few weeks ago, the Commission granted a license to NJ Transit which includes 800 MHz public safety spectrum.[4] In other words, contrary to Harris' repeated claims,[5] neither the Waiver Order,[6] nor the Order on Clarification[7]

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[2] Initially, in response to the *Request for Waiver of Sections 90.209, 90.210 and 2.1043,* ET Docket No. 09-234 filed November 20, 2009 by the TETRA Association, Harris argued that a waiver of Part 90 Rules was unnecessary because "TETRA technology could be modified to comply with Part 90 Rules." See Comment, Harris Corporation, WT Docket 1-69, ET Docket No. 09-234 (January 15, 2010). Thus, Harris previously proposed exactly what PowerTrunk did, i.e., PowerTrunk modified its TETRA equipment to comply with Part 90 Rules.

[3] Harris never raised an objection to the NJT publically advertised bid specification which expressly identified that TETRA was an acceptable technology to present in a bid response until after the NJT Board voted its approval on March 14, and authorized its Chairman to enter into a contract with Alcatel-Lucent. See PowerTrunk's *ex parte* of March 23, 2012 for the relevant documents.

[4] NJ Transit applied for ten frequency pairs in the interleaved band. File No. 0005222152. The frequency 858.0125 MHz was among them. This frequency is in the Public Safety Pool. See Rule 90.613. The application was granted May 18, 2012.

[5] Besides that of March 16, 2012, *see ex partes* filed March 28, April 2, and April 10.

nor the on-going TETRA rulemaking[8] impose any restrictions on the use of public safety channels by PowerTrunk's D-LMR equipment.

On the contrary, Harris' Petition that the rules be changed amounts to an admission that its prior arguments -- to the effect that PowerTrunk's equipment did not comply with Commission Orders or existing Rules -- were, and are, groundless.

Even looked at in isolation, however, the Petition does not warrant consideration.

Harris argues that use of Mask B introduces a risk of harmful interference to public safety operators, and is contrary to a settled practice among equipment vendors to use only Mask H equipment.[9] The argument is without merit.

Rule 90.210 does not make a distinction between digital and analog modulated signals in regard to the acceptability of any given transmitter equipped with an audio low pass filter. That is, a digital transmitter equipped with an audio low pass filter implemented in the digital domain qualifies for certification under Mask B for NPSPAC spectrum, just as much as a transmitter with analog modulation.[10]

Consistent with this, when the Commission certified PowerTrunk's D-LMR equipment for use under Part 90, PowerTrunk explained that its digital equipment complied with Mask B because it contains an audio low pass filter (Ex. B). In the staff's response, the Chief of the Equipment Authorization Branch agreed, after consultations with the Wireless Bureau, that it was appropriate to certify PowerTrunk's equipment using Mask B precisely because it has such a filter (Ex. C).[11] Harris' position that all digitally modulated waveforms should be required to

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[6] Notice of Proposed Rulemaking and Order, 26 FCC Rcd 6503 (2011).

[7] *Ibid*, 26 FCC Rcd 13360 (2011).

[8] WT Docket No. 11-69 and ET Docket No. 09-234.

[9] Harris completely ignores that the Commission is considering the use of Adjacent Channel Power (ACP) on the basis that it is useful, and might be more accurate in determining relative interference potential over emission masks. Waiver Order at ¶¶ 9 and 11.

[10] Indeed, in 1999 the Commission eliminated Rule 90.211, which had proscribed the acceptability of digital equipment with an audio low pass filter. The Commission's decision was consistent with the technological evolution of land mobile radio equipment. Restoring Rule 90.211 -- which Harris in effect seeks to do -- would have the consequence of disqualifying all audio filtering implemented in the digital domain over the last thirteen years by multiple vendors. *See* PowerTrunk's ex parte of March 23, 2012 in this proceeding at 6.

[11] Although the equipment at issue operates in the 450-470 MHz band, the rationale underlying the FCC's decision applies equally to the 800 MHz spectrum as audio filtering is not dependent on the RF frequency band.

adhere to the more stringent H-Mask thus amounts to an effort to second-guess the Commission's Laboratory on a matter which has long since become final. It is not supported by FCC rules or practice, and is a groundless attempt to use the regulatory processes so as to tilt the playing field against marketplace competition.[12]

Harris' says that "[t]he fear is that use of the 'audio low-pass filter proviso could lead to the creation of interference . . . ."[13] Its argument is based on conjecture; lacking from the Petition are any field measurements or other observed interference effects.

This is particularly significant because, once equipment has been certified by the FCC, it has traditionally been the role of the Regional Planning Committee ("RPC") to coordinate the use of frequencies on a case-by-case basis precisely to avoid interference among systems. Harris' Petition fails to identify any reason why the RPCs are unable to perform this function with respect to PowerTrunk's D-LMR equipment.

The example provided by Harris confirms that its own OpenSky 4-slot TDMA equipment would cause the same "interference" that Harris claims to fear, i.e., its declared emission level (-46 dBc) is much higher than the maximum allowed to keep the adjacent channels unaffected.[14] Because factors other than emitted power must be considered when evaluating potential interference, the RPC takes into account how distant the neighboring systems are and what antenna systems are used to concentrate the RF power in a given geographical area. In other words, even though Harris' own equipment requires RPC frequency coordination in order to avoid potential interference when deployed, Harris would have the Commission spend scarce resources to preempt RPC coordination of PowerTrunk's competing equipment.

Furthermore, the grant of Harris' Petition would enshrine a less-spectrally-efficient technology in the Commission's Rules. The use of the voice-centric technology advocated by Harris for data transmission requires the use of more channels. Compared to PowerTrunk's D-LMR, OpenSky has half the data capacity and significantly less speech quality for systems operating on public safety channels (PowerTrunk's D-LMR offers 36 Kbit/s per 25 KHz channel vs. OpenSky's 19.2 Kbit/s per 25 KHz channel). This means that OpenSky takes more channels to implement advanced, data-intensive applications (for example, state-of the-art AVL). Thus, Harris' Petition would have the Commission adopt rules to benefit a less spectrum-efficient technology over more spectrum-efficient designs -- designs which, through proper frequency

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[12] Harris argues that PowerTrunk's filter is not an audio low pass filter, but rather a "spectral shaping filter." Petition at 5. This assertion is contradicted by the Lab's finding as cited above.

[13] Id. at 3.

[14] See Petition at page 2. In order to protect adjacent channels in the NPSPAC band, attenuation needs to be on the order of -60 dBc which is the typical value requested for 12.5 KHz channel spacing.

coordination, can fully meet end-users' increasing demand for advanced data features without an increase in potential interference.

Harris also ignores the fact that the need to coordinate a greater number of frequency blocks for a less spectrally efficient network, as would be required for an OpenSky-based network to get similar functionality to what PowerTrunk equipment offers, presents its own challenges to an RPC. For example, an RPC may have much greater difficulty coordinating eight frequencies than it would coordinating four frequencies, e.g., it would likely be easier to find non-adjacent frequencies, even on the same site. If accepted, Harris' proposal would either increase spectrum congestion or prevent end-users from selecting equipment based on their own unique data throughput and voice traffic needs as determined by each end-user in a competitive environment. In any event, it will be more difficult for an RPC to coordinate the extra channels required for use of OpenSky equipment versus those of D-LMR.

Finally, there is no merit to Harris' argument that the Commission should mandate a modulation scheme for mutual aid channels. According to Harris, this is necessary because allegedly PowerTrunk's modulation scheme is not currently compatible with "the common modulation scheme employed by all other certified equipment ..." for operation on mutual aid channels.[15] Obviously, Harris has an outdated vision of the currently available technology as indeed IQ modulation (used by PowerTrunk) is capable of generating analog FM signals. For example, CML, a well-known manufacturer of digital integrated circuits, offers its CMX980A and CMX981 which allow generating various digital and analog waveforms, including analog FM. Harris' self-serving opinion on how other manufacturers should implement their equipment to comply with the existing Rules, is not a proper basis for petitioning the Commission to invoke its rulemaking authority. Therefore, Harris' misleading statements with regard to the alleged future capability of PowerTrunk to generate analog FM signals with its D-LMR equipment are misguided and do not warrant consideration by the Commission.[16]

Harris' request is a solution in search of a problem. The existing Commission's Rules about interoperability are sufficiently broad in scope, particularly in view of the additional interoperability requirements and criteria defined at the various state levels. Harris's proposal that the Commission implement rules solely to fulfill Harris' view of interoperability, including an immediate freeze on future certifications, is inconsistent with the established interoperability requirements implemented at the federal and state level and lacks any merit. Specifically, with respect to PowerTrunk, PowerTrunk has already advised the Commission that its intention is

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[15] Petition at 8-9.

[16] A comprehensive explanation of the principles to generate analog FM signals with IQ modulation schemes can be found at http://www.eetasia.com/ARTICLES/2002NOV/A/2002NOV12_RFD_PD_AN01.PDF?SOURCES=DOWNLOAD.

conducting equipment certification in full compliance with all applicable interoperability rules.[17] Therefore, the effect of a freeze on certification would be to perpetuate Harris' and other legacy vendors' lock on the LMR equipment market, to the prejudice of the many customers eager to identify more cost-effective LMR solutions, and to the detriment of the Commission's overarching mandate for spectrum conservation.

Conclusion

Commission Rule 1.401 states that "Petitions which are moot, premature, repetitive, frivolous, or which plainly do not warrant consideration by the Commission may be denied or dismissed without prejudice to the petitioner." For the reasons set forth above, the Harris Petition "plainly [does] not warrant consideration," and should be denied, if not dismissed.

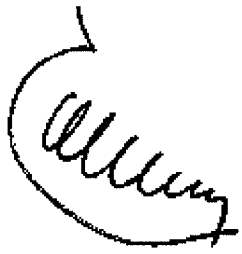
The Petition is repetitive. It represents an obvious attempt to have the Commission re-adjudicate issues which the agency has already twice resolved, first in 2010 when the Lab approved PowerTrunk's equipment authorization for its D-LMR equipment for the services regulated under Part 90, and more recently when the Commission granted New Jersey Transit's application for 800 MHz interleaved channels, a grant which included public safety spectrum.

The Petition is likewise unsupported, i.e. it is bereft of any field measurements documenting interference effects; an alternative regulatory regime (RPC coordination) is in place to guard against any untoward interference effects in the unlikely event they should materialize as between neighboring users; and initiation of a rulemaking, much less adoption of the requested freeze on the use of D-LMR equipment in public safety channels, and on the certification of such equipment, would deprive numerous transit agencies and public utilities of the choice of a spectrum-efficient solution to their communications needs.

[17] See Ex Parte Notice, PowerTrunk Inc., WT Docket 1-69, ET Docket No. 09-234 (February 28, 2012).

Under all the circumstances, it would be a waste of scarce Commission resources to entertain the Petition, or the requested freeze.

Respectfully submitted,



Jose Martin
Executive Vice President

Cc: Charles Mathias
David Furth
Michael Wilhelm
Roberto Mussenden
Brian Marenco
Scot Stone
Melissa Tye
Tim Maguire

CERTIFICATE OF SERVICE

I, the undersigned, hereby certify that on June 28, 2012 a true and correct copy of the attached PowerTrunk's letter dated June 28, 2012 in Opposition to Harris' Petition for Rulemaking, (RM No. 11663), was sent by facsimile and First Class Mail to the following person:

Tania W. Hanna
Harris Corporation
Government Relations
600 Maryland Avenue, S.W.
Suite 850E
Washington, D.C. 20024
(202) 729-3700 (telephone)
(202) 729-3735 (facsimile)

EXHIBIT A

THE BENEFITS OF TRANSITIONING TO A NATIONWIDE WIRELESS BROADBAND NETWORK FOR PUBLIC SAFETY

JUNE 2011

The Benefits of Transitioning to a Nationwide Wireless Broadband Network for Public Safety

At a recent hearing before the Senate Commerce Committee, New York City Police Commissioner Raymond Kelly remarked that a 16-year-old with a smartphone has "more advanced communications capability than a police officer or deputy carrying a radio."[1] The failings of public safety communications systems include both interoperability—with the limitations of current systems becoming tragically apparent on 9/11 and in the aftermath of Hurricane Katrina[2]—and operability—with the cost-effectiveness and performance of traditional public safety devices trailing well behind those provided by modern commercial cellular operators.

With the emerging rollout of commercial services marketed as 4G, LTE-based wireless services, there is a once-in-a-generation opportunity to transform the effectiveness of our first responders through a national strategy to develop and deploy a nationwide wireless broadband network for public safety. Such a broadband service promises to enhance the effectiveness of public safety agencies and, if developed appropriately, can also ultimately replace their legacy (and very expensive) communications infrastructure and devices.

This report explains how the President's Wireless Innovation and Infrastructure Initiative can facilitate the transition away from the traditional, fragmented world of public safety communications to a next generation system. It begins by providing the relevant context, explaining, among other things, the drawbacks of today's systems, and it concludes by discussing benefits and opportunities made possible by a successful transition to an LTE-based nationwide network. In so doing, it recognizes that this transition will take some time and, in order for it to be successful, it must planned carefully, coordinated effectively, and begin as soon as possible.

I. The Legacy of Land Mobile Radio Systems and the Rise of the Modern Cellular Industry

Public safety agencies were the original pioneers of wireless technology. Indeed, public safety's use of Land Mobile Radio ("LMR") services dates back almost a century.[3] The Detroit Police Department, for example, used an early form of LMR in 1921, experimenting with a one-way (base-to-vehicle) system.

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1. Police Commissioner Raymond W. Kelly: Testimony on "Safeguarding Our Future: Building a Nationwide Network for First Responders," U.S. Senate Committee on Commerce, Science, & Transportation, at 1 (Feb. 16, 2011) *available at* http://commerce.senate.gov/public/?a=Files.Serve&File_id=04981480-8117-4289-905d-c1498aa72ee1.

2. *The 9-11 Commission Report: Final Report of the National Commission on Terrorist Attacks Upon the United States,* (July 22, 2004), *available at* http://www.gpoaccess.gov/911/Index.html; "The Federal Response to Hurricane Katrina: Lessons Learned" (Feb. 2006), available at http://www.whitehouse.gov/reports/katrina-lessons-learned.pdf.

3. This historical discussion is drawn from Dale N. Hatfield, *The Technology Basis for Wireless Communications, in* THE EMERGING WORLD OF WIRELESS COMMUNICATIONS 49 (1996).

Based on the technology available at the time, systems like this one used Amplitude Modulation ("AM") located in the frequency range just above the AM broadcast band. Later, public safety agencies began to use systems in the Very High Frequency ("VHF") band, using the more effective Frequency Modulation ("FM") band.

Over time, as public safety communications technology advanced, the FCC authorized new spectrum allocations for these services. In the mid-1970s, for example, the FCC allocated additional spectrum in the 800 MHz band for private LMR (including public safety entities), making spectrum available not only for the traditional and conventional, single-channel dispatch systems described above, but also "multi-channel trunked systems."[4] Building on the increasing interest in developing such systems and encouraging "interoperability" among them, the public safety community launched a standards development effort that evolved into the Project 25 Initiative (P25).[5]

While the P25 effort made progress in facilitating greater levels of interoperability among first responders, there remains no national, interoperable LMR network and equipment costs remain very high. Several challenges hindered the progress of the P25 effort. Notably, over a decade after P25 got moving, the GAO concluded that "ambiguities in the published standards [for the Project 25 initiative] have led to incompatibilities among products made by different vendors, and no compliance testing has been conducted to ensure that vendors' products are interoperable...As a result, state and local agencies have purchased fewer, more expensive radios, which still may not be interoperable and thus may provide them with minimal additional benefits."[6] Since that GAO report, the Federal government has created a compliance assessment program for P25 equipment, and while successful, the program has limitations based on the level of industry participation and standards development progress.

Beyond P25 specifically, the lack of better-coordinated public safety communications reflects two basic historical facts. First, as a general matter, first responders are supported by state and local revenue bases and have always bought equipment from their own local budgets. As such, efforts to improve interoperability involved the difficult work of coaxing agencies that traditionally operated on their own to begin working with one another. Second, because for decades public safety was forced to provision its own services, public safety communications grew up in an environment in which being a "smart controller" of services provided by another entity was not an option. In the modern broadband world, by contrast, public safety agencies are generally not operating their own networks. They either procure such services from commercial providers (such as Verizon or Sprint) or they contract with a vendor to operate a network on their behalf (as Northrop Grumman has for New York City).

Over the last 25 years, the modern cellular industry has expanded exponentially. By the late 1980s, the commercial cellular industry was just beginning to outgrow the public safety community in terms of size and significance as a user of wireless technologies. From around 340,000 U.S. subscribers in 1985,

4. An Inquiry Relative to the Future Use of the Frequency Band 806-960 MHz; and Amendment of Parts 2, 18, 21, 73, 74, 89, 91, and 93 of the Rules Relative to Operations in the Land Mobile Service Between 806 and 906 MHz, *Second Report and Order*, 46 F.C.C. 2d 752, ¶¶ 16-17 (May 1, 1974).

5. Telecommunications Industry Association, Project 25, Public Safety Communications Interoperability—Frequently Asked Questions Available on TIA Web Site, PulseOnline, Oct. 2004, http://pulse.tiaonline.org/article.cfm?id=2057.

6. U.S. Gov't Accountability Office, First Responders: Much Work Remains to Improve Communications Interoperability 4 (2007).

commercial wireless grew nearly tenfold over the next 25 years, reaching over 300 million subscribers in 2010. Public safety, however, has largely continued to use wireless services outside this evolving commercial ecosystem. As such, it has failed to benefit from the economies of scale and the ongoing innovation that has taken place in that sector.

II. A Next Generation Public Safety Communications System

The success of the modern cellular industry has enabled its users to reap enormous benefits in operability—including ongoing innovation and cost-performance capabilities—and interoperability—where all users can access one another (for both voice and text communications). The requirements for public safety differ from commercial wireless users, however, making conventional commercial services generally unsuitable for public safety's mission-critical communications.

The traditional LMR systems and devices developed for public safety have served public safety agencies well with regard to meeting their unique requirements. Most notably, such systems are developed to provide rapid voice call-setup and group-calling capabilities. (Ordinary cellular systems, by contrast, can allow for seconds to go by before a call is delivered and answered.) When time is of the essence, as is often the case when public safety agencies need to communicate, it is important to have access to systems that achieve fast call-setup times. Similarly, unlike ordinary cellular systems, dispatch systems like those used by public safety allow for large talk groups to communicate either among individual units or by broadcast messages (think: "calling all cars").

Above and beyond rapid call-setup and group-calling capabilities, public safety agencies also depend on a number of other important functionalities. Most notably, public safety relies on devices that allow for a handset feature known as "talk-around," which enables two or more mobile or portable units to communicate without the aid of network infrastructure. In the case of emergency situations where such infrastructure is not available, a peer-to-peer mode of communications is crucial. Similarly, modern public safety dispatch networks provide queuing and priority access capabilities that traditional cellular networks were not designed to provide. In short, despite their operability and interoperability limitations, traditional LMR systems have provided public safety agencies with mission-critical capabilities that conventional cellular systems have not generally offered. These systems will continue to be essential for public safety communications until broadband systems are able to meet public safety requirements, particularly for mission-critical voice.

While maintaining their traditional LMR systems, public safety agencies are increasingly using commercial broadband systems to support their missions. Such agencies are adopting modern broadband systems in different shapes and forms, including using laptop computers in vehicles, as secondary communications devices (e.g., a smartphone), or for remote video monitoring. In many cases, agencies have relied on commercial off-the-shelf services. In some cases, jurisdictions have procured services directly, such as New York City's relationship with Northrop Grumman to build and operate a broadband wireless network.[7]

7. Press Release, Northrop Grumman, Northrop Grumman Wins $500 Million New York City Broadband Mobile Wireless Contract (Sept. 12, 2006), *available at* http://www.it.northropgrumman.com/pressroom/press/2006/pr31.html.

The development and deployment of LTE systems represent a new opportunity for public safety communications. For starters, public safety can develop and deploy a nationwide network that will enable greater levels of operability and interoperability in the mobile broadband arena than public safety has ever achieved in the world of traditional LMR systems. Moreover, this opportunity holds the promise of public safety systems that could be developed based on commercial standards to generate significant economies of scale, competition in equipment as well as services, and ongoing innovation of the kind experienced in the modern cellular industry. With the move to LTE, public safety can seize this very opportunity.

Given the growth of commercial services, the opportunity to leverage such assets promises to make the development and deployment of an LTE wireless broadband network for public safety far less expensive than it would if public safety were to own and operate such a network itself. In 1991, such a model (with less than 10,000 sites nationwide) was far from appealing. By contrast, the situation in 2011 (with more than cell sites in service) makes this a compelling opportunity.

The challenges of using commercial infrastructure are not dissimilar to those of adapting the commercially developed LTE standard and ordinary services to meet the requirements of public safety. In particular, public safety communications systems must be survivable and able to function in the midst of a natural or man-made disaster. To that end, such systems require a degree of "hardening" and back-up power capability that can ensure that they are available during times of emergency. As with the development of lower cost devices, the opportunity to use infrastructure that can be shared between public safety and other users can greatly lower the cost for public safety communications. Notably, basic infrastructure—towers, high capacity lines, and electricity costs—can be shared in an environment where public safety has its own spectrum and network that meets its particular needs.[8] And as Part III explains, the President's Wireless Initiative provides a framework to make such a network possible.

III. The President's Wireless Initiative and Public Safety Communications

In his 2011 State of the Union address, President Obama announced his Wireless Innovation and Infrastructure Initiative,[9] specifically referencing the opportunity for a firefighter to use a handheld device to download the floor plans of a building before arriving at the scene of an emergency. Such technology, which could enhance the effectiveness of our first responders, is routinely used by enterprises like Federal Express to enhance their mission.[10] For our first responders, however, the best they can do in the current environment is to adopt ad hoc solutions based on commercial technology. Given the appropriate federal leadership, public safety can shape the development of emerging broadband solutions to specifically meet its needs, thereby providing a transition path away from its legacy equipment and networks.

8. Access to back-up satellite systems might well be another requirements for certain public safety systems, insofar as such a capability provides another backup network as well as an ability to communicate in remote areas.

9. The White House. "President Obama details plan to win the future through expanded wireless access." February 2011. http://www.whitehouse.gov/the-press-office/2011/02/10/president-obama-details-plan-win-future-through-expanded-wireless-access.

10. Hamblen, Matt. "FedEx to adopt rugged handhelds from Motorola." *Computerworld*. September 2009. http://www.computerworld.com/s/article/9138071/FedEx_to_adopt_rugged_handhelds_from_Motorola.

As President Obama outlined, the Wireless Initiative pays for itself and would reduce the deficit by enabling more efficient use of wireless spectrum and by freeing up spectrum for auction. This initiative catalyzes investment and innovation in the wireless broadband ecosystem by freeing up 500 MHz of spectrum over ten years through more efficient federal government and private sector use of this resource. This effort is expected not only to drive investment and innovation, but also to generate almost $28 billion in revenue. Obtaining such revenue, for which President Obama has reserved almost $10 billion in his 2012 Budget for deficit reduction, depends on Congress acting to authorize the FCC to conduct "voluntary incentive auctions" as well as an updated framework to facilitate the more efficient use of government spectrum (i.e., an update of the Commercial Spectrum Enhancement Act).

After using the proceeds from spectrum auctions to reduce the deficit, President Obama proposed four related measures to spur investment and innovation in next generation wireless technologies for public safety purposes. In two related steps, President Obama called for an investment in a nationwide wireless network for public safety communications based on 4G technology, and for the rollout of 4G services to at least 98% of the American population. These two steps are related because the construction of 4G services to otherwise unserved parts of the country will enable both public safety agencies to use those services and for citizens living in those areas to obtain service. Third, President Obama called for the D Block, which is a band of spectrum in the 700 Megahertz band that is required to be auctioned, to be reallocated for public safety. Finally, President Obama has championed the creation of a Wireless Innovation (WIN) Fund that would, among other things, support investments in research that would enable LTE-based technology to meet the particular requirements of public safety for mission critical data, voice, and video.

For the core commitments of President Obama's plan to be realized, Congress will need to address the relevant funding, technology, and governance issues that will enable a nationwide network for public safety to be developed and deployed.

Developing an effective nationwide public safety governance structure will be crucial to ensuring that public safety has access to a network with far greater levels of operability and interoperability than it has ever had before. A key part of this effort is moving away from the traditional path of individual jurisdictions making isolated purchasing decisions on equipment, devices, and services. Under that legacy model, the equipment and infrastructure were generally costlier, open standards that enabled public safety to support an innovation ecosystem (such as an "apps store" for public safety) did not exist, and even neighboring systems (or sometimes even communications systems within the same jurisdiction, such as fire and police) could not interoperate. Absent a governance system that will drive standard setting activity and ensure that local purchasing decisions support interoperability, there is a strong possibility that we will repeat the mistakes of LMR in the wireless broadband arena.

The management of wireless broadband network development and deployment requires an effective and empowered nationwide governance system. In particular, developing nationwide wireless broadband services tailored for public safety will require a national body that can specify the requirements for public safety communications, hold the license for public safety broadband spectrum, and oversee a competitive bidding process to enlist the best providers that can develop, deploy, and operate the appropriate wireless broadband system. Such a body should be composed of highly competent professionals, including leaders in the field of public safety, information technology, and cellular communications networking, operations, and deployment.

The continued development of effective regional, statewide, and local governance mechanisms is similarly critical to enabling the effective use of a wireless broadband network developed for public safety. In particular, such mechanisms ensure that the control over the network—including what agencies have priority in what circumstances—is exercised in a well coordinated fashion and is responsive to end user needs. Moreover, such mechanisms provide a basis for identifying key local issues with respect to coverage and opportunities for sharing infrastructure.

IV. The Opportunity for Cost Savings and Enhanced Effectiveness from a Nationwide Next Generation Public Safety Communications System

The development and deployment of a nationwide public safety next generation network promises significant opportunities for long term cost savings and improved functionality. While there are considerable initial Federal budgetary costs to establish a nationwide network, they will be offset in the medium and long run by three primary sources of savings: (1) reduced government spending focused on overseeing and managing today's fragmented and inefficient networks; (2) savings from reduced device and infrastructure costs; and (3) innovation enabled by competition and market entry as public safety adopts a modern wireless standard.

Even more important than the money saved, the Nation's first responders and public safety agencies will, on account of this initiative, be safer and more effective because they will have at their disposal a wealth of new devices, applications, and other cutting-edge technology. From accessing video images of a crime in progress, downloading building plans of a burning building to a handheld device, or connecting rapidly and securely with personnel from other towns and cities, a nationwide wireless broadband network for public safety will make a difference on a day-to-day basis—and not merely during the most severe emergencies when the availability of an interoperable and operable network will be at its most important.

A. The benefits from achieving a fully interoperable system

First and foremost, developing and deploying a nationwide wireless broadband system provides a unique opportunity to develop and deploy a network that is interoperable by design. The benefit of interoperability by design is difficult to capture as an economic matter because its value is in the more effective emergency response capability that results from those at the scene of an incident enjoining seamless and easily managed communications networks. It is also difficult to capture the costs of the assorted interoperability measures now being used, ranging from swapping radios to using Internet-based gateways to patch together non-interoperable systems.[11] In short, not only would interoperability be effectively achieved at the network level—providing our first responders with a greater level of effectiveness—but it would be achieved far more cost-effectively than today's solutions allow.

11. It merits note that such measures will continue to be used for the reasonably foreseeable future in that the transition to an LTE-based interoperable environment that replaces today's legacy LMR systems may well take a decade. Moreover, during this transition period, it will be important for LTE systems to have a level of backward compatibility to legacy LMR systems.

B. The benefits from a coordinated system for public safety communications

Today's public safety communication systems not only lack some of the capabilities of modern networks and commercial devices, but the systems are also fragmented across thousands of Federal, State, and local jurisdictions. This fragmentation puts the responders—and the public—at risk in emergencies like 9/11 or Hurricane Katrina, when different law enforcement agencies could not talk to one another. But beyond reducing the effectiveness of our public safety officials, this fragmentation also adds to the cost of communications systems, reducing resources for governments at every level. As one commenter explained:

> Particularly since 9/11, there has been great concern about the possibility of failures due to lack of interoperability, and failures due to a shortage of public safety spectrum. This paper shows how both of these and other serious problems are a logical consequence of America's fragmented approach to public safety, in which thousands of local agencies make independent decisions without a coherent strategy to unify or guide them. Because of this fragmented approach, public safety agencies build more infrastructure than they should, spend more taxpayer money than they should, and consume more scarce spectrum than they should, all for a system that is unnecessarily prone to interoperability failures.[12]

In general, the costs of maintaining this fragmented system are borne by Federal, State, and local governments. On the Federal front, DHS will award over $2 billion in grants for preparedness and homeland security as part of the FY2011 Budget, with many of the programs supporting communications procurement. Moreover, in a one-time infusion in 2007, the joint NTIA/FEMA Public Safety Interoperable Communications Grant program awarded $968 million to fund interoperable communications in 56 States and Territories.[13]

These costs to the Federal government—and the expenses incurred by State and local agencies—could be reduced substantially through the economies of scale gained by transitioning to a nationwide, interoperable network. An analysis of several different approaches concluded that the costs of this transition would be paid for in reduced spending towards the current, fragmented network within several years:

> Given the tremendous inefficiencies of the current fragmented system, as demonstrated above, it is perhaps no surprise that the cost of building an entire nationwide system is comparable to what is likely to be spent in just a few years to upgrade and maintain the existing infrastructure. For example, in the wake of 9/11, the U.S. federal government has dispersed billions of dollars in grants just to address communications issues at the state and local level, and billions more will be needed. In fact, the cost to upgrade the entire existing infrastructure has been estimated at $18 billion. In contrast, we found

12. Peha, Jon M. "How America's fragmented approach to public safety wastes money and spectrum," 33rd Telecommunications Policy Research Conference (September 2005), http://repository.cmu.edu/cgi/viewcontent.cgi?article=1029&context=epp&sei-redir=1#search="peha+waste+money+public+safety+communications.

13. Department of Commerce. National Telecommunications and Information Administration. "Public Safety Interoperable Communications (PSIC) Grant Program." Accessed May 2011. http://www.ntia.doc.gov/psic/index.html.

that deploying a single 700MHz nationwide network that carries voice and data will cost about $10 billion.[14]

In addition to savings on Federal grants, one of the very significant benefits and opportunities from the President's plan is to provide federal first responders with the opportunity to use this network. It will require, however, just the sort of network—with the intelligent control capabilities of an advanced network—discussed herein to provide such users with the capabilities and assurances they need. To ensure that the public safety network is built to meet the requirements not only of public safety, but also Federal first responders, the Emergency Communications Preparedness Center is in the process—under the leadership of DHS—of developing an assessment of their broadband communications requirements.

C. Savings through economies of scale on devices and infrastructure

As it stands today, there are more than 2 million first responders in the Federal, State, and local governments.[15] This includes nearly 300,000 firefighters, more than 630,000 police patrol officers, and countless other public safety workers such as forest fire inspectors, correctional officers, and security guards. The Federal government, moreover, employs around 100,000 individuals in protective service occupations. Many of these public servants rely on advanced communication infrastructure and devices to go about their jobs every day. For our Federal, State and local governments, extra spending on communications devices comes directly out of the budget used to hire and retain police officers, fire fighters, and other first responders—not to mention education, healthcare, road maintenance, and other public services. Once it is fully implemented, the President's plan will allow governments at all levels to save on communications device and infrastructure costs, leaving more resources for State and local governments to improve public safety and other services.

The cost difference between traditional devices used by public safety and commercially available ones is quite stark. As a recent Congressional Research Service report found, "the latest radios developed for public safety...cost between $4,000 and $6,000. The current narrowband radios being used for 700 MHz networks typically start at $3,000."[16] By contrast, commercially-available 4G smartphones cost around $600.[17] To be sure, as explained above, this is not an apples-to-apples comparison. Although commercial smartphones have some functions that go beyond public safety communications devices—think of Internet-enabled applications available on such devices—they lack the ruggedness, reliability, rapid calling and conferencing, and direct device-to-device connectivity of traditional LMR systems and equipment. Consequently, a core part of the President's initiative focuses on developing the necessary technology based on the LTE standard to meet the requirements of public safety, enabling public safety to use commercially-developed handsets.

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14. Hallahan, Ryan and Jon M. Peha. "Quantifying the costs of a nationwide public safety wireless network." Working Paper. Carnegie Mellon University. Accessed May 2011. http://www.andrew.cmu.edu/user/rhallaha/papers/quantifying_costs_of_PS_network.pdf.

15. U.S. Department of Commerce. Bureau of the Census. Occupational Employment Statistics. National Occupational Employment and Wage Estimates by Ownership. Protective Service Occupations. May 2009 (most recent available). http://www.bls.gov/oes/current/999001.htm.

16. Moore, Linda K. "Public safety communications and spectrum resources: Policy issues for Congress." Congressional Research Service. September 2010. http://www.fas.org/sgp/crs/misc/R40859.pdf.

17. M. Maesto, "Apple Selling Unsubsidized Phones for $500-700: Report," *available at* http://www.eweek.com/c/a/Mobile-and-Wireless/Apple-Selling-Unsubsidized-iPhones-for-500-to-700-Report-682945/.

Once the relevant requirements are built into public safety systems based on 4G technology, end user devices for such systems are expected to be between five and ten times less expensive than today's LMR technology. As the Congressional Research Service concluded, "The participation of commercial carriers in developing and deploying, for example, a common radio interface, is expected to put the cost of public safety radios in the same price range as commercial high-end mobile devices ($500)."[18] Similarly, an analysis by Andrew Seybold concluded that "the overall cost savings will be substantial and we believe that the industry is willing to work with the public safety community to provide the types of devices it requires at reasonable costs."[19]

With respect to savings on infrastructure, public safety communications systems that leverage existing commercial (and governmental) infrastructure can be cost effective. Similarly, using greater leverage in procuring devices that are used across a national network also promises considerable cost savings. In examining this issue recently, the FCC found that leveraging available commercial systems could save considerably on capital expenditures compared with relying on the existing public safety communications infrastructure.[20]

D. Providing better performance and cost effectiveness through innovation

Public safety communications will benefit from a broader market for devices and technology, overcoming the fragmentation of today's often-proprietary systems and improving interoperability through non-proprietary, open standards of commercial wireless technology. Participation in a broader market based on open standards will also allow public safety to enjoy the benefits that come from many more firms competing to offer goods and services. Not only will devices and infrastructure be upgraded and improved based on advances in commercial technology, but public safety's adoption of an Internet-based framework will enable developers to provide open and standards-based applications for public safety use. To facilitate this opportunity, the President's plan calls for clear, nationwide standards that make public safety systems interoperable across jurisdictions and vendors.

Government Accountability Office findings support the fact that the lack of an open standards and a commercially vibrant ecosystem constitutes a critical weakness in public safety communications.[21] Further, a recent Federal Communications Commission letter to the Chairman of the House Committee on Energy and Commerce describes how clear, nationwide standards have the potential to rectify the poor performance currently experienced in public safety.[22] In particular, the FCC explained "the beneficial effect of competition through open standards" as follows:

18. Federal Communications Commission. Letter to the Honorable Henry Waxman. July 20, 2010. http://democrats.energycommerce.house.gov/documents/20100726/Letter.FCC.07.26.2010.pdf.

19. Seybold, Andrew. "Comments on the FCC White Paper: Federal Communications Commission Omnibus Broadband Initiative." April 2010. http://andrewseybold.com/1572-white-paper-response-to-fcc-white-paper.

20. FCC. OBI Technical Working Paper No. 2. "A broadband network cost model: A basis for public funding essential to bringing nationwide interoperable communications to America's first responders." May 2010. http://download.broadband.gov/plan/fcc-omnibus-broadband-initiative-(obi)-technical-paper-broadband-network-cost-model-basis-for-public-funding-essential-to-bringing-nationwide-interoperable-communications-to-americas-first-responders.pdf.

21. GAO. "First Responders: Much work remains to improve communications interoperability." April 2007. http://www.gao.gov/new.items/d07301.pdf.

22. Federal Communications Commission. Letter to the Honorable Henry Waxman. July 20, 2010. http://democrats.energycommerce.house.gov/documents/20100726/Letter.FCC.07.26.2010.pdf.

> P25 systems still rely upon proprietary solutions and the beneficial effect of competition through open standards is not fully realized. A comparison to Tetra, a European standard similar to P25 but which was successfully completed in 1995, makes this stagnation clear. Though similar in function to P25, Tetra products are both more spectrally efficient than P25 and significantly cheaper...A broad framework for interoperability is essential to ensuring that this network is interoperable from day one and remains so as the technology evolves.

The former Los Angeles Chief of Police testified that modern broadband networks for public safety would allow law enforcement to deploy a range of innovative new technologies: "Today, many agencies have established Real Time Crime Centers that are leveraging new technologies to do an even more effective job of fighting crime...New technologies such as automated license plate readers, biometrics, medical telemetry, automated vehicle location, and streaming video only scratch the surface of the capabilities that will be carried by broadband networks."[23] Similarly, New York City Police Commissioner Raymond Kelly reiterated the importance of modernizing public safety communications in Congressional testimony in February:

> [An effective broadband network] could provide officers with an immediate, digital snapshot of anyone they detain. It would give them the suspect's address, prior arrest history, and other critical details. The officer would be able to take electronic fingerprints at the scene and compare them instantaneously with those in local, state, and federal databases. This kind of situational awareness is vital to the safety of the officers and members of the public.[24]

The testimony above clearly demonstrates public safety communications' need for nationwide, interoperable, open, standards-based voice and data broadband networks to replace the legacy public safety systems in use today. Of the many benefits a nationwide broadband network could enable, perhaps the most critical is to improve situational awareness and provide the opportunity for comprehensive identification.

In a public safety setting, accurate information about the subject, the surrounding area, and the environment is critical. Law enforcement and other public safety practitioners make better and more informed decisions when interacting with the public if they can access comprehensive identification and databases containing a range of information (e.g., driver's licenses or other photos; records of warrants, arrests, prison time, school attendance, or history of violent behavior; and customs and immigration status). Even current information with respect to weather or environmental concerns such as flood plains and wind direction can improve a practitioner's ability to do an effective and efficient job. But all of this information—pictures, records, video, etc.—requires bandwidth and the technology necessary to deliver such information to a handheld device. As explained above, that technology does not need to be invented, only tailored to meet the needs of public safety.

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23. Bratton, William. Testimony Before the House Committee on Energy and Commerce Subcommittee on Communications, Technology, and the Internet. September 2009. http://democrats.energycommerce.house.gov/Press_111/20090924/bratton_testimony.pdf.

24. Kelly, Raymond. Testimony before the Senate Committee on Commerce, Science, and Transportation." February 2011. http://pdf.911dispatch.com.s3.amazonaws.com/senate_hearing_d-block_feb2011.pdf.

One example of comprehensive identification and improved situational awareness is the use of license plate readers. Public safety is quickly recognizing the value of license plate reader (LPR) technology in both the fight against crime and the battle against terrorism. LPRs are used in fixed, portable, and mobile environments to check against a defined alert lists for wanted status.[25] These lists may be combined or customized as needed and may include thousands of plate numbers at any given time. Checking vehicle status via LPR can be done hundreds, even thousands, of times in a single shift. Without LPRs, a patrol officer determines wanted status by either manually entering a plate via an in-car computer system or requesting the check by radio. Recognizing a wanted vehicle solely by observation relies on memory or reference to a printed list called a "hot sheet." Since LPR checks require little to no action on the part of the officer, full attention can be given to other tasks, such as driving or looking for crimes in progress, making the entire process much more effective while enhancing public and officer safety.

No matter how the data transport is achieved, the available bandwidth to provide the connectivity is critical to the performance of the system. Although some agencies still rely on manual flash drive updates at shift changes to update LPR systems, many are moving to wireless connectivity (3G, 4G, WiFi, and satellite) to improve the timeliness of data uploads. Fixed and portable LPRs may have the benefit of wired connectivity for updating data, but increasingly are dependent on wireless connectivity because LPRs tend to be installed in remote locations or areas lacking fixed infrastructure.

Another example of comprehensive identification and improved situational awareness is the dramatic increase in both use and value of streaming video to and from emergency vehicles in the field. A doctor at a hospital, with real-time broadband data communication with an enroute rural ambulance crew, might more swiftly recognize a patient's symptoms, and be able to give instructions to the ambulance crew resulting in potentially better life-saving treatment. (Also see Appendix A).

In-car video can also be useful in providing visual information to mobile command posts and emergency operations centers in the event of a major incident. As an example, a patrol officer responding to a structure fire can provide real-time visual assessment of the structure and provide specific information relevant to proper response that an individual patrol officer may not even be aware is relevant to fire personnel. This provides incident command staff and emergency operations much better situational awareness and understanding as input to command decisions, and as in the previous example, much more rapid and appropriate response to evolving situations.

Conclusion

The President's Wireless Initiative promises to both improve public safety's effectiveness and reap savings by providing public safety with a state-of-the-art nationwide wireless broadband system. Such a system will finally enable it to benefit from economies of scale of commercial infrastructure and devices as well as ongoing competitive innovation in that ecosystem. As such, the ultimate savings and benefits from this transition are very likely to eclipse and more than compensate for the upfront investment in a nationwide, modern broadband network. Most importantly, this effort will provide public safety officials

25. An LPR takes a photo of the license plate using a Smart Phone or Tablet PC camera and runs a check against a defined list. *See* Appendix A.

with access to a modern communications network that will enable them to better protect themselves, our families, and homeland security.

Appendix A

Examples of Innovative Applications for Public Safety Broadband

1. **License Plate Reader**
   By taking a photo using a smartphone or Tablet PC's camera, the investigator can automate the process to capture the license plate information to determine if the car is stolen and its registered owner. Not only can the photo be stored, but information such as location and date/time can be useful intelligence.

2. **Fingerprint Identification**
   Through M2M technologies tethered to the smartphone of Tablet PC, the fingerprint of a subject can be collected and searched against Law Enforcement databases to quickly identify a person and assess the level of threat incorporating the existing capabilities from Quick Capture Platform (QCP) and Repository for Individuals of Special Concern (RISC). QCP enables the mobile identification and enrollment using a mobile system. RISC enables rapid search to quickly assess the level of threat within seconds with two to ten fingerprint images in a mobile environment.

3. **Facial Recognition**
   By taking a picture with a smartphone or Tablet PC's, a subject's photograph can be matched against existing databases such as the DMV or booking databases to determine identity.

4. **Scars, Marks, and Tattoos**
   By taking a picture with a smartphone or Tablet PC's camera, a symbol can be matched against existing databases to determine identity, relationships, and intelligence such as symbol affiliation, last time seen, contributing department/agency, etc.

5. **Field Interview Cards**
   After conducting a field interview, an investigator can enter the information in a timely manner without the need to return to the office. The investigator can also query the database for relevant data on previous interviews.

6. **Crowd Sourcing and Interactive Maps**
   In multi-agency operations such as the Inauguration and Super Bowl, crowd sourcing applications along with interactive maps enhance situational awareness by providing real-time data and gathering intelligence through geo-location aware services.

7. **Local, State, Federal Data**
   Various apps with the ability to query Local, State, and/or Federal databases will provide investigators the ability to selectively search the appropriate repositories and return the right amount of information in a timely manner. This also applies in the EMS field.

8. **Child Abduction Leads Tracking**
   To expedite law enforcement response in Amber alert cases, integration of leads tracking functionality into Virtual Command Center will facilitate leads assignments and investigator updates in the field environment. Geographic information system (GIS)/visual-based icon-driven

situational awareness and common operating picture user interfaces connecting operational data bases.

9. **Multi-vital sign patient data transmission and access to patient history,** including real-time multi-vital sign data, current patient status (medic notes in real time), and high-definition video (patient and imaging video and stills, e.g., CT and ultrasound) regardless of location (e.g. emergency department, incoming helicopter, incoming back-up ambulance(s)).

EXHIBIT B

teltronic

FEDERAL COMMUNICATIONS COMMISION
Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

Attention: Mr. Joe Dichoso (Equipment Authorization Branch Chief)
C.C.: Mr. Rashmi Doshi (Chief of the Laboratory Division)

July 14, 2010

Re: Inquiry number 955470

Dear Mr. Dichoso,

First of all, I hope that you are the correct person to whom to address for this issue. If not, I would greatly appreciate it if you would forward this inquiry to the appropriate office and/or indicate back to us who we should contact.

My name is Jose Roman, and I represent the company Teltronic S.A.U. in Spain and its US subsidiary, PowerTrunk Inc., for certification issues for our products.

With respect to KDB Inquiry nº 955470, I have a few questions in order to try to understand the reasons why the issue remains unresolved despite the information submitted to FCC by the test laboratory TIMCO which handled the certification process for us.

- In April 2010, TIMCO Engineering Inc. sent to the FCC all the necessary information, together with the corresponding test report, in order to obtain the grant for our HTT-500 digital radio. TIMCO sent to Teltronic the provisional grant on 14 April 2010, with FCC Identifier WT7PTRKTHTT500410. (See attached annex: 226AUT10_GRANT)
- On 25 May 2010, Teltronic received notification from the FCC that our application was dismissed. The reason stated by the FCC is that "The test report does not show compliance with the appropriate Mask C." (See attached annex: FCC letter to Teltronic, dated 11 May 2010)
- Teltronic prepared a document in response to this notification which was presented to the FCC on 7 June through TIMCO. This document explains the reasons why our equipment should be considered to comply with Mask B. It describes the low pass audio filter of the HTT-500 and the modulation characteristics of the equipment. In the same document we also explain that the equipment tested is not a standard TETRA device, but rather one which has been modified in order to comply with FCC regulations. (See attached annex: Letter_to_TIMCO&FCC_100604ed0500)

Given the above situation, we wish to make the following points:

1. The HTT-500, which is the object for this certification, is a digital radio based on TETRA technology, but which has been modified in order to comply with FCC rules; in particular, for FCC Part 2.1049(c), "Occupied Bandwidth". The modification consists of a change in the RCC (root raised cosine) filter. Specifically, the roll-off factor applied is 0.2 instead of 0.35 as used by standard TETRA equipment.

   With this modification the HTT-500 complies with FCC rules as demonstrated in the test report by TIMCO. (See attached annex: 226AUT10TestReport_Rev4)

TELTRONIC, S.A.UNIPERSONAL
Polígono de Malpica, Calle F - Oeste
50057 ZARAGOZA
Tfno.(34) 902 418016
Fax (34) 976 465720
http://www.teltronic.es

teltronic S.A. Unipersonal

teltronic

2. Teltronic is not aware of any restriction applicable to its product to impede certification of the HTT-500. We therefore do not understand why when complying with the established FCC rules for this type of equipment that we cannot obtain the grant. We request that FCC confirm to us whether any such restriction exists.

3. A waiver request has been presented by the TETRA Association to allow the use of standard TETRA technology in the USA (see attached annex: FCC Public Notice, ref. DA 09-2633, released December 24, 2009), given that TETRA technology as specified by the original ETSI standard does not comply with all established FCC requirements. Teltronic understands that this waiver request is a process completely independent from the certification of the HTT-500 since we have already stated that it is not a standard TETRA device and since it does comply with FCC rules for this type of equipment.

   We would like to know if FCC is associating the two processes together, and if so, if the waiver request is acting as an obstacle to certification of the HTT-500. It would be very interesting to Teltronic for the FCC to state its opinion about this issue, as well as indications as to how this problem could be resolved.

4. Teltronic would like to know if the argument presented in its reply to the FCC concerning the application of Mask B (see attached Letter_to TIMCO&FCC_100604ed0500), in which the situation is completely described, is correct. If this is not correct, then we would like to know exactly the position of the FCC on this point and what would be the solution.

5. We appreciate if you would please indicate to us how we should proceed in order to reach a satisfactory solution to certification in the shortest amount of time possible, given that the negative impact of a prolonged unresolved situation is inhibiting the business development activity of our US subsidiary, PowerTrunk Inc.

Thank you for your kind attention on this matter, and we look forward to your soonest response.

Sincerely,

Jose Román Gimeno
Certifications & Services Area Manager
Teltronic S.A.U.

Attachments:
- FCC letter to Teltronic, dated 11 May 2010
- 226AUT10_GRANT. Provisional Grant.
- Letter_to_TIMCO&FCC_100604ed0500. Reply to FCC.
- 226AUT10TestReport_Rev4. Test report.
- FCC Public Notice, ref. DA 09-2633, released December 24, 2009

TELTRONIC, S.A.UNIPERSONAL
Polígono de Malpica, Calle F - Oeste
50057 ZARAGOZA
Tfno.(34) 902 418016
Fax (34) 976 465720
http: //www.teltronic.es

EXHIBIT C

From: Joe Dichoso [mailto:Joe.Dichoso@fcc.gov]
Sent: Wednesday, July 28, 2010 12:39 PM
To: Jose Roman
Cc: Tim Maguire; Laura Martinez; Alfredo Calderon; Joe Dichoso
Subject: RE: INQUIRY NUMBER 955470

Hello Jose,
We have confirmed with the Wireless Bureau. Yes, you can apply the Mask B to this device with an audio low pass filter.
Regards,
Joe

From: Jose Roman [mailto:j-roman@teltronic.es]
Sent: Wednesday, July 28, 2010 10:32 AM
To: Joe Dichoso
Cc: Tim Maguire; 'Laura Martinez'; 'Alfredo Calderon'
Subject: RE: INQUIRY NUMBER 955470

Dear Joe,

I enclose the required plots.

Could you say me if you need any additional documentation?

I await your answer.

Best regards

Jose Roman

-----Mensaje original-----
De: Joe Dichoso [mailto:Joe.Dichoso@fcc.gov]
Enviado el: martes, 27 de julio de 2010 21:51
Para: Jose Roman
CC: Tim Maguire; Laura Martinez; Alfredo Calderon; Joe Dichoso
Asunto: RE: INQUIRY NUMBER 955470

Hello Jose,
Please provide an occupied bandwidth plot showing compliance with the 20 kHz bandwidth requirement in the table of 90.209.
Thanks

-----Original Message-----
From: Jose Roman [mailto:j-roman@teltronic.es]

Sent: Tuesday, July 27, 2010 11:51 AM
To: Joe Dichoso
Cc: Tim Maguire; 'Laura Martinez'; 'Alfredo Calderon'
Subject: RE: INQUIRY NUMBER 955470
Importance: High

Dear Joe,

We would like to know if the information provided yesterday related to the audio low pass filter is enough to justify the application of Mask B to our equipment (HTT-500).

Could you give us an answer today?

I am sorry, but we don't know what else to do for clarifying this misunderstanding. We think we have provided all the required information to solve this formal process and to apply for the FCC Grant.

Best regards.

Jose Roman.

-----Mensaje original-----
De: Jose Roman [mailto:j-roman@teltronic.es]
Enviado el: lunes, 26 de julio de 2010 21:21
Para: 'Joe Dichoso'
CC: 'Tim Maguire'; 'Laura Martinez'; 'Alfredo Calderon'
Asunto: RE: INQUIRY NUMBER 955470

Dear Joe,

Yes, we can measure the frequency response of the audio low pass filter. The attached plot is the real response measured by our engineers.

If you need we could explain to you how we can measure it.

Best regards
Jose Roman

-----Mensaje original-----
De: Joe Dichoso [mailto:Joe.Dichoso@fcc.gov] Enviado el: lunes, 26 de julio de 2010 20:29
Para: José Román
CC: Tim Maguire; Laura Martinez
Asunto: RE: INQUIRY NUMBER 955470

So you are able to measure the audio low pass filter by itself within the IC and the data is attached?

-----Original Message-----
From: José Román [mailto:j-roman@teltronic.es]
Sent: Friday, July 23, 2010 11:50 AM
To: Joe Dichoso
Cc: Tim Maguire; 'Laura Martinez'
Subject: RE: INQUIRY NUMBER 955470

Dear Joe,

Let me to explain you.

In our first letter to FCC ("Letter_to_TIMCOFCC_100604ed0500") we explained that the audio low pass filter is wholly contained in the audio processing IC (STMicroelectronics STw5093). As the filter is contained within the IC, from the outside of the HTT-500 cannot get the frequency response of this filter alone. It is that we tried to explain in this letter.

For this reason, we included in this first letter the frequency response of this filter included in the datasheet of the Integrated Circuit (table in page 2 of the letter). This response is supplied directly by the manufacturer of this IC. We thought that this information was sufficient to show that the equipment had a low pass filter and to show the frequency response of this filter.

In your response to TIMCO on 07/19/2010, you require us the plot of this low pass filter. For this reason, we have measured directly the frequency response of this filter, using our knowledge of our equipment. This plot was measured directly over the IC

Therefore the attached plot is the true frequency response of our filter.

I hope that this explanation will be sufficient for your understanding of the low pass filter.

Anyway, I can arrange a conference call with our engineers for solving all your doubts. I think it could be very interesting in order to clarify the problem. We will be available on next Monday at anytime.

If you have any doubt, don't hesitate to contact with me.

Thanks in advance.

Best regards

Jose Roman

-----Mensaje original-----
De: Joe Dichoso [mailto:Joe.Dichoso@fcc.gov] Enviado el: viernes, 23 de julio de 2010 15:05
Para: José Román
CC: Tim Maguire; Laura Martinez
Asunto: RE: INQUIRY NUMBER 955470

Hello Jose,

Please clarify. This was the response when the data was first asked for. It says that the audio low pass filter isn't available. We need the test data for the audio low pass filter. It appears that you are resubmitting some other low pass filter data.
Thanks,

Joe

---Reply from Customer on 07/09/2010---

Yes there is a pending petition for conentional TETRA radio but conventional TETRA using a standard industry 0.35 raised cosine filter factor does not meet the requirements and a TETRA using a RC filter with a 0.2 factor does. There are currently other certificated TETRA radios (see Sepura grantee code XX6). As to the technical question of the response of the audio low pass filter, the audio low pass filter is wholly contained in the audio processing IC and as such isn't available externally to measure and plot but tabulated data on the low pass filter is included in the technical brief is a chart (see chart labeled STW5093) from the IC manufacturer's data sheet.

-----Original Message-----
From: José Román [mailto:j-roman@teltronic.es]
Sent: Thu 7/22/2010 11:58 AM
To: Joe Dichoso
Cc: Tim Maguire; Laura Martinez
Subject: RE: INQUIRY NUMBER 955470

Dear Joe,

Yesterday we sent to TIMCO the audio low pass filter response, with a little explanation. Anyway, data of this low pass filter is contain in the letter that I sent you last week and in the test report.

I attach the response that I sent to TIMCO

Plot with measured frequency response for audio low pass filter is attached according to FCC requirement 2.1047(a). See "Frequency Response for Audio Low Pass Filter (STw5093 STMicrolectronic codec).pdf"

This filter is contained in the audio signal processing IC, which is STw5093 STMicroelectronic Codec.

Frequency range from 100Hz to 5KHz is shown in the plot as specified in 2.1047(a)

This issue has already been indicated as a table from manufacturer(STMicroelectronic) in both "Letter_to_TIMCO&FCC_100604ed0500" (page 2) and "226AUT10TestReport_Rev4" Section "Audio Low Pass Filter - VOICE MODULATED COMMUNICATION EQUIPMENT" (page 19).

I hope that this information will be sufficient for you. Please, if you need any additional information, don't hesitate to require me.

I would like to manage this inquiry directly with you, without any intermediary, in order to avoid misunderstanding.

I await your answer.

Best regards.

Jose Roman

De: Joe Dichoso [mailto:Joe.Dichoso@fcc.gov] Enviado el: jueves, 22 de julio de 2010 16:43
Para: José Román
CC: Tim Maguire
Asunto: RE: INQUIRY NUMBER 955470

Hello Jose,

It is up to you how you want to handle the inquiry. To clarify, it was proposed to use Mask B instead of Mask C. Mask B is for devices with an audio low pass filter. Section 2.1047 requires appropriate data for devices with and audio low pass filter. However, you said that it cannot be supplied. If this data cannot be supplied, a waiver is needed.

Thanks,
Joe

From: José Román [mailto:j-roman@teltronic.es]
Sent: Thursday, July 22, 2010 3:05 AM
To: Joe Dichoso
Subject: RE: INQUIRY NUMBER 955470
Importance: High

Dear Joe,

We apologize for the inconvenience caused, but I would like that you explain me the present situation.

When Teltronic receive the inquiry we tried to solve through TIMCO, but the inquiry remained without solution. For this reason, Teltronic contacted directly with you, in order to manage the problem directly with FCC.

I am worried because we don't understand the reasons why this problem still isn't solved.

Yesterday, I spoke with TIMCO, and TIMCO had received a notification for FCC that said:

"The data is required per 2.1047. If the data is not submitted, approval of a waiver is needed."

As you say in your previous e-mail, I understand that it is the response of FCC to TELTRONIC letter that I sent to you last week. Could you confirm me it?

In this case, If you will be so kind, I would like that you indicate me the appropriate way to solve this problem. Should we continue to manage through TIMCO? Or Can we manage directly with you?

Thanks in advance.

Best regards.

José Román Gimeno (j-roman@teltronic.es)

Certifications & Services Area Manager / Jefe Area de Certificaciones y

Servicios

R&D Dept./ Dpto. I+D

TELTRONIC, S.A.U.

Polígono Malpica. Calle F - Oeste - Parcela 12.

50057 ZARAGOZA (Spain)

Phone: +34 976 465656 / +34 902 418016 Ext. 273

Fax: +34 976 465722 <http://www.teltronic.es/> http://www.teltronic.es

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De: Joe Dichoso [mailto:Joe.Dichoso@fcc.gov] Enviado el: miércoles, 21 de julio de 2010 17:26
Para: José Román
Asunto: RE: INQUIRY NUMBER 955470

You need to check with the person/test lab who submitted the inquiry.

From: José Román [mailto:j-roman@teltronic.es]
Sent: Wednesday, July 21, 2010 11:15 AM
To: Joe Dichoso
Subject: RE: INQUIRY NUMBER 955470

Dear Joe,

I have introduced the KDB inquiry number (955470) in the OET KDB, but there isn't any response.

Do I need to use another KDB inquiry number?

I am worried for this issue.

Thanks in advance.

Best regards.

José Román Gimeno (j-roman@teltronic.es)

Certifications & Services Area Manager / Jefe Area de Certificaciones y Servicios

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De: Joe Dichoso [mailto:Joe.Dichoso@fcc.gov] Enviado el: lunes, 19 de julio de 2010 19:18
Para: José Román
CC: Rashmi Doshi; Alfredo Calderon; Diane Poole
Asunto: RE: INQUIRY NUMBER 955470

Jose,

We will be sending you a response via the KDB.

Thanks,

Joe

From: José Román [mailto:j-roman@teltronic.es]
Sent: Wednesday, July 14, 2010 2:55 PM
To: Joe Dichoso
Cc: Rashmi Doshi; 'Alfredo Calderon'
Subject: INQUIRY NUMBER 955470

Dear Mr. Dichoso

My name is Jose Roman, and I represent the company Teltronic S.A.U. in Spain and its US subsidiary, PowerTrunk Inc., for certification issues for our products.

I would like to clarify some issues respect to the KDB Inquiry nº 955470.

I attach a letter with our explanation and doubts about this inquiry (Please see the document "Letter to FCC_100714"). Also I include other annexed documents to facilitate your understanding of the letter.

We look forward to your soon response. Don't hesitate to contact with me if you have any doubt.

Sincerely

José Román Gimeno (j-roman@teltronic.es)

Certifications & Services Area Manager / Jefe Area de Certificaciones y Servicios

R&D Dept./ Dpto. I+D

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